

## REMARKS

### **I. Claim amendments**

Claim 1 has been amended to incorporate embodiments of the invention disclosed in claims 2-4, now canceled. Support for the amendment is provided by the claims as originally filed and by the specification at page 3, lines 30-32. Claims 11-15, 19, 20, 23, 24, and 41 have been amended to remove the dependency upon canceled claims 2-4. As claims 2-4 have been canceled, the rejections of these claims under 35 U.S.C. §103(a) are moot and should be withdrawn.

Claim 25 has been amended to recite that the claimed method is a quantitative analysis of a turbid sample to establish quantitative analytical parameters of the sample. Support for the amendment is provided by the specification at page 2, lines 12-20.

Claim 26 has been amended to recite that the means for detecting the intensity of emitted radiation detects transmitted and reflected radiation from the sample. Support for the amendment is provided by the specification at page 3, lines 30-24; and page 8, lines 23-25.

Claims 24 and 31 has been amended to correct a minor informality in accordance with the Examiner's comments in the Office Action. Withdrawal of the objection to claims 24 and 31 is requested. No new matter has been added by any amendments herein.

Applicants submit that the claim amendments were not done in acquiescence of any objection or rejection relating to patentability. Rather, the claims were amended to advance the application to allowance so that Applicants may enjoy the benefits, without delay, conferred by a U.S. patent for subject matter deemed allowable. Applicants reserve the right to file one or more continuation applications to defend the patentability of patentable subject matter that may have been removed by the claim amendments.

### **II. The claimed invention**

The claimed invention is directed to a method and apparatus for obtaining quantitative properties of a turbid pharmaceutical sample. The turbid sample is irradiated with an excitation beam of radiation, and the intensity of the radiation emergent from the sample is measured as a function of both the wavelength of the emitted radiation and the photon propagation time through the sample. In one embodiment, the emitted radiation comprises transmitted radiation and

diffusely reflected radiation, and this emitted data is used to obtain quantitative data concerning the composition of the sample.

### **III. Rejections under 35 U.S.C. §102**

Claim 25 is rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by US 5,813,988 to Alfano et al. (“Alfano”). Claim 25 is also rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by US 6,400,396 to Bowker.

Anticipation requires that each and every feature of the claimed invention be disclosed in a single prior art document. Applicants submit that Alfano and Bowker do not disclose the invention of amended claim 25.

#### **A. Alfano**

As expressly stated in column 5, lines 47-52, Alfano is interested in providing a solution to the following problem: “given intensity measurements taken around the media either with objects located therein ... or without objects located therein, ... reconstruct a spatial map of the change in optical parameters (absorption and diffusion coefficients) due to the presence of hidden objects”. Alfano discloses, therefore, a method using intensity measurements to form an image of an object in the scattering turbid medium (col. 3, lines 47-52). As such, it is implicit that Alfano’s method is designed to provide only location data for an object located in the turbid medium, i.e., to provide a *qualitative* analysis of the sample. Furthermore, the only example (cols. 7-9) provided by Alfano discloses obtaining the temporal position of an object in a scattering medium. There is no disclosure of any kind of a non-qualitative analysis of a sample, i.e., a quantitative analysis as claimed.

#### **B. Bowker**

Bowker discloses an apparatus for obtaining an image of an object embedded in a turbid medium (col. 1, lines 59-61). Bowker only discloses a *qualitative* analysis, i.e., one that provides positional data for an object in a medium. For example, typical images are the surface of the medium, a reflecting object, and a shadow from the reflecting object (col. 5, lines 40-42). As illustrated in Figures 1A and 1B, the apparatus is envisioned to be used to locate large items

in open water by air. There is no disclosure that the apparatus can be used to obtain any kind of non-spatial, non-temporal information about a sample, i.e., a quantitative analysis as claimed.

#### C. The method of claim 25

In contrast to both Alfano and Bowker, the method of claim 25 is directed to a *quantitative* analysis of a sample. As such, claim 25 is directed to a method for obtaining data regarding analyte concentration in the sample (page 9, line 28-32). By time-resolving the spectral information obtained from excitation of a sample, the method of claim 25 makes it possible to establish quantitative parameters of the sample, such as content, concentration, structure, and homogeneity (page 3, lines 25-29). Advantageously, the method of claim 25 can be used to obtain a quantitative analysis of a solid pharmaceutical sample such as a tablet or capsule (page 2, lines 12-14).

There is no disclosure by Alfano or Bowker, either expressly or inherently, of a method or apparatus that provides a *quantitative* analysis of the components of the sample as claimed. As previously stated, Alfano and Bowker only disclose a method that provides *qualitative* information about a sample. Accordingly, this feature of the invention of claim 25 is novel and not anticipated by either Alfano or Bowker. Therefore, the rejections of claim 25 under §102(b) and §102(e) is improper and should be withdrawn.

### IV. Rejection under 35 U.S.C. § 103(a)

#### A. Alfano in view of Gillespie

Claims 1-8, 11, 14-24, 26-28, 31-38, and 40-45 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Alfano in view of US 5,828,452 to Gillespie et al. (“Gillespie”)

Applicants respectfully submit that there is no motivation to combine Alfano with Gillespie, and further that the cited combination of Alfano and Gillespie does not lead to the inventions of independent claims 1 and 26.

**Alfano does not disclose or suggest measurement of emitted radiation comprising transmitted radiation and diffusely reflected radiation.**

Alfano discloses a method of imaging objects in highly scattering turbid media (Abstract). The method involves illuminating a turbid medium with a pulse of light, and determining the intensity of the *diffusive* component of the light emergent from the scattering medium. The intensity determinations are used to form an image of the object in the turbid medium (col. 3, lines 49-59).

In contrast to Alfano, the inventions of amended claims 1 and 26 detect the intensity of *transmitted radiation and diffusely reflected radiation* which is emitted from the sample upon irradiation (page 3, lines 30-33). The detection of the emitted radiation, comprising the transmitted radiation and diffusely reflected radiation, enables the researcher to establish quantitative parameters of the sample, such as content, structure, and homogeneity (page 3, lines 25-29).

The Examiner's reliance on Alfano for a disclosure of measuring the intensity of the transmitted radiation and diffusely reflected radiation of the emergent light is misplaced. There is no suggestion that Alfano detects both transmitted and diffusely reflected radiation from the sample. As previously stated, Alfano only discloses measuring the diffuse component of emergent light from the sample. Gillespie does not overcome the deficiencies of Alfano to suggest a method comprising measuring transmitted and diffusely reflected radiation.

In addition, there is no motivation to combine Alfano with Gillespie. Contrary to the Examiner's remarks on page 8 of the Office Action, Gillespie's disclosure of "medical diagnostics, clinical chemistry, environmental analysis, and other fields" does not rise to the level of suggestion that Gillespie could be used to analyze turbid pharmaceutical samples. Gillespie does not disclose or suggest that analysis of turbid pharmaceutical samples is possible using the disclosed process. Accordingly, one of ordinary skill in the art of pharmaceutical analysis would not be motivated to combine Alfano and Gillespie to obtain the claimed invention. Furthermore, such a combination would not yield the claimed invention.

Claims 5-8, 11, 14-24, 27-28, 31-38, and 40-45, which are directly or indirectly dependent upon claims 1 and 26, are patentable over Alfano and Gillespie for the same reasons that the inventions of claims 1 and 26 are patentable over these references. Accordingly, the

rejection of claims 1, 5-8, 11, 14-24, 26-28, 31-38, and 40-45 under §103(a) should be withdrawn.

#### **B. Alfano in view of Gillespie and Cameron**

Claims 9, 10, 12, and 29 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Alfano in view of Gillespie and US 5,936,739 to Cameron et al. (“Cameron”).

Applicants submit that their comments in Section A, above, regarding the rejection of claims 1, 5-8, 11, 14-24, 26-28, 31-38, and 40-45 under §103(a) is applicable and, therefore, responsive to the rejection of claims 9, 10, 12, and 29 in further view of Cameron. Cameron fails to overcome the above-recited deficiencies to suggest the claimed invention. Accordingly, withdrawal of the rejection of claims 9, 10, 12, and 29 under §103(a) is requested.

#### **C. Bowker in view of Gillespie**

Claims 1, 2, 5-7, 11, 13-16, 20-22, 24, 26-28, 30-36, 38, 39, 41, and 43-45 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bowker in view of Gillespie.

Claims 1 and 26 have been amended to incorporate the embodiment of former claim 4, now canceled, which was not rejected for obviousness reasons in view of Bowker and Gillespie. Therefore, independent claims 1 and 26 are patentable over the cited combination of Bowker and Gillespie for the same reasons that claim 4 was deemed to be patentable over this combination of references. Claims 2, 5-7, 11, 13-16, 20-22, 24, 27-28, 30-36, 38, 39, 41, and 43-45, which directly or indirectly depend upon claims 1 and 26, are also patentable over Bowker and Gillespie for the same reasons that claims 1 and 26 are patentable. Withdrawal of the rejection of claims 1, 2, 5-7, 11, 13-16, 20-22, 24, 26-28, 30-36, 38, 39, 41, and 43-45 under §103(a) is requested.

#### **D. Bowker in view of Gillespie and Cameron**

Claims 9, 10, 12, and 29 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bowker in view of Gillespie and Cameron.

Applicants submit that their comments in Section C, above, regarding the rejection under §103(a) in view of Bowker and Gillespie, is applicable and, therefore, responsive to the rejection

of claims 9, 10, 12, and 29 in further view of Cameron. In brief, Bowker and Gillespie do not disclose or suggest the claimed invention, and Cameron fails to overcome the deficiencies of Bowker and Gillespie to suggest the claimed invention. Accordingly, withdrawal of the rejection of claims 9, 10, 12, and 29 under §103(a) is respectfully requested.

## V. Information Disclosure Statement

It has come to Applicants' attention that the Information Disclosure Statement ("IDS") filed on March 1, 2002 was not made of record and entered into the application file. Accordingly, Applicants are providing a duplicate copy of the previously-filed IDS, Form PTO-1449, and cited references. Applicants are also providing a copy of the return postcard which accompanied the IDS. The return postcard was stamped by the PTO on March 12, 2002, evidencing the IDS was received by PTO before issuance of the first Office Action on May 8, 2003. Accordingly, no fee should be due in connection with the resubmission of the IDS.

Consideration of the documents cited in the IDS is respectfully requested.

The following documents have been made of record but not relied up for a prior art rejection: US 6,124,937 to Mittenzwey et al.; US 5,422,719 to Goldstein; US 5,758,653 to Schotland; US 5,303,026 to Strobl et al. Applicants submit that the cited documents neither disclose nor suggest the claimed invention.

**SUMMARY**

Upon entry of this Amendment, claims 1 and 5-45 are pending. Applicants submit that the invention of claims 1 and 5-45 has been distinguished over the cited prior art, and that the pending claims are in condition for allowance, which action is earnestly solicited.

Authorization is hereby given to charge any fee in connection with this communication to Deposit Account No. 23-1703.

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Respectfully submitted,



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Enclosure: Copy of IDS filed March 1, 2002 and cited references.